

## **Periodic Table Objectives**

### **Chemistry Objectives — The Periodic Table**

**Goals: To be able to explain the history and organization of the modern periodic table, the people instrumental in developing it, and to use the periodic table as a tool in knowing chemical characteristics of the common elements.**

#### **I. History of the Periodic Table**

##### **A. Mendeleev, Moseley, and Chemical Periodicity**

1. Explain the origin of the periodic table.
2. Why was it necessary to organize the elements into a table?

##### **B. Tell the contributions of:**

###### **1. Dmitri Mendeleev**

- a. What 2 pieces of information about each element did he use to organize them?
- b. What was wrong with his table?
- c. Did he know this? How?

###### **2. Moseley**

- a. What did he find?
- b. How did his discovery affect Mendeleev's periodic table?
- c. Explain why the elements are not in perfect order according to atomic mass.

#### **II. The Modern Periodic Table**

##### **A. Which subatomic particle determines the chemical and physical properties of an element?**

##### **B. How is the modern periodic table arranged? Describe it.**

##### **C. Be able to explain the following WRT the periodic table:**

1. Groups
2. Representative elements
3. Periods (atomic number)
4. State the periodic law
5. How can the periodic law be used to predict physical and chemical changes?

#### **III Arrangement of the Periodic Table**

- A. Metals
- B. Nonmetals
- C. Metalloids
- D. Noble Gases
- E. Halogens
- F. Alkali Metals
- G. Alkaline Earth Metals
- H. Transition metals
- Rare Earth Elements (Lanthanides, Actinides)

#### **IV. Periodic Properties of Elements**

##### **A. Periodic Trends in Atomic Size**

1. Atomic sizes - how are they estimated? (WHY are they estimated?)
2. Group trends - Where, in general, are they smallest? Largest?
3. Periodic trends - Where, in general, are they smallest? Largest?
4. What is the shielding effect?

##### **B. Periodic Trends in Ionization Energy**

1. Define ionization energy
2. Group trends
3. Periodic trends

##### **C. Periodic Trends in Electron Affinity**

1. Define electron affinity
2. Group trends
3. Periodic trends

##### **D. Periodic Trends in Ionic Size**

1. What is an ion? How does it form?
2. Explain how gaining or losing electrons affect the size of an ion
  - a. Compare to the atoms location on the periodic table
3. Group trends
4. Periodic trends

##### **E. Periodic Trends in Electronegativity**

1. Define electronegativity
2. Group trends
3. Periodic trends
4. Be sure you know which element is the most electronegative, and why.

#### **IV. Using the Periodic Table: an application**

- A. Be able to tell the number of protons, neutrons, and electrons in a neutral atom by looking at the periodic table.

#### **V. Characteristics of Elements**

Know characteristics of common elements discussed and demonstrated in class. . .

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